GROUP 22A

MANUAL TRANSAXLE

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GENERAL INFORMATION

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These manual transaxles come in the models, namely, F5MBB.

Item		Specification
Transaxle model		F5MBB
Transaxle type		5-speed forward, 1-speed reverse constant mesh
Transaxle gear ratio	1st	3.538
	2nd	1.913
	3rd	1.333
	4th	1.028
	5th	0.820
	Reverse	3.583
Final gear ratio (Differential gear ratio)		4.235

LUBRICANT

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Item	Specified lubricant	Quantity
Transaxle oil dm^3 (qt)	DiaQueen NEW MULTI GEAR OIL API classification GL-3, SAE 75W-80	2.5 (2.6)

SPECIAL TOOLS

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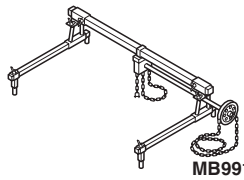
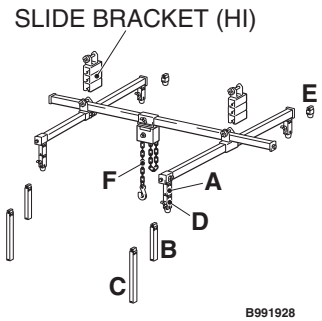
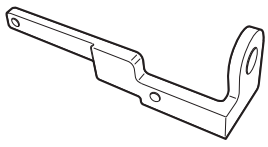
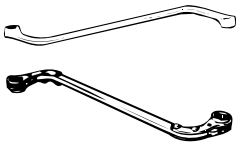
Tool	Tool number and name	Supersession	Application
	MB991895 Engine hanger	Tool not available	When the engine hanger is used: Supporting the engine assembly during removal and installation of the transaxle assembly
	MB991928 Engine hanger A: MB991929 Joint (50) ×2 B: MB991930 Joint (90) ×2 C: MB991931 Joint (140) ×2 D: MB991932 Foot (standard) ×4 E: MB991933 Foot (short) ×2 F: MB991934 Chain and hook assembly	Tool not available	
	MB992201 Engine hanger plate	–	
	MB990900 or MB991164 Door adjusting wrench	MB990900-01	Removal and installation of transaxle mounting insulator

MANUAL TRANSAXLE DIAGNOSIS

INTRODUCTION

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The manual transaxle can exhibit any of the following symptoms: noise or vibration is generated, oil leaks, shifting gears is hard or troublesome, or the transaxle jumps out of gear.

The causes of these symptoms could come from: incorrect mounting, the oil level may be low, or a component of the transaxle may be faulty.

TROUBLESHOOTING STRATEGY

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Use these steps to plan your diagnostic strategy. If you follow them carefully, you will be sure that you have exhausted most of the possible ways to find a manual transaxle fault.

1. Gather information from the customer.
2. Verify that the condition described by the customer exists.
3. Find the malfunction by following the Symptom Chart.
4. Verify malfunction is eliminated.

SYMPTOM CHART

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Symptom	Inspection procedure	Reference page
Noise, Vibration	1	P.22A-4
Oil Leaks	2	P.22A-6
Hard Shifting	3	P.22A-6
Jumps Out of Gear	4	P.22A-7

SYMPTOM PROCEDURES

Inspection Procedure 1: Noise, Vibration

DIAGNOSIS PROCEDURE

STEP 1. Check the idle speed.

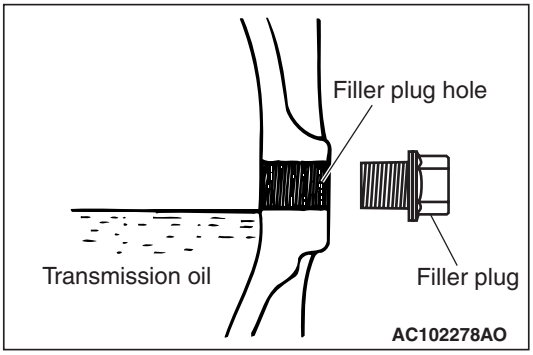
Q: Does the idle speed meet the standard values?

YES : Go to Step 2 .
NO : Refer to GROUP 11AP.11A-13, On-vehicle Service – Idle Speed Check.

STEP 2. Check whether the transaxle and engine mount is loose or damaged.

Q: Are the transaxle and engine mount loose or damaged?

YES : Tighten or replace the part. Then go to Step 7 .
NO : Go to Step 3 .



STEP 3. Check that the oil level is up to the lower edge of the filler plug hole.

Q: Is the oil level up to the lower edge of the filler plug hole?

YES : Go to Step 4 .
NO : Refill DiaQueen NEW MULTI GEAR OIL API classification GL-3, SAE 75W-80. Then go to Step 7 .

STEP 4. Check for the specified oil.

Q: Is the specified oil DiaQueen NEW MULTI GEAR OIL API classification GL-3, SAE 75W-80?

YES : Go to Step 5 .
NO : If in doubt, replace the oil. Refer to P.22A-8. Then go to Step 7 .

STEP 5. Remove the transaxle. Check the axial play of the input and output shafts.

Q: Does the axial play of the input and output shafts meet the standard value?

YES : Go to Step 6 .
NO : Adjust the axial play of the input and output shafts. Then go to Step 7 .

STEP 6. Disassemble the transaxle. Check the gears for wear and damage.

Q: Are the gears worn or damaged?

YES : Replace the gears. Go to Step 7 .
NO : Go to Step 7 .

STEP 7. Retest the systems.

Q: Is the noise or vibration still there?

YES : Return to Step 1 .
NO : The procedure is complete.

Inspection Procedure 2: Oil Leaks

DIAGNOSIS PROCEDURE

STEP 1. Visual check.
Raise the vehicle, and check for oil leaks. If oil leak is difficult to locate, steam clean the transaxle and drive the vehicle for at 10 minutes. Then check the leak again.

Q: Is the oil leak(s) found?
YES : Go to Step 2.
NO : Check for the oil leaks around the engine. Then go to Step 4.

STEP 2. Visual check at the clutch housing.

Q: Do oil leaks appear around the joint between the engine and the clutch housing?
YES : Remove the transaxle. Check the input shaft oil seal, and replace if necessary. Then go to Step 4.
NO : Go to Step 3.

STEP 3. Check the oil seal or O-ring for damage.

Q: Is the oil seal or O-ring damaged?
YES : Replace the oil seal or the O-ring. Then go to Step 4.
NO : Go to Step 4.

STEP 4. Retest the system.

Q: Is the oil still leaking?
YES : Return to Step 1.
NO : The procedure is complete.

Inspection Procedure 3: Hard Shifting

DIAGNOSIS PROCEDURE

STEP 1. Check the transaxle control

Q: Are the shift cable and the select cable in good condition?
YES : Go to Step 2.
NO : Repair or replace the shift cable and the select cable. Refer to P.22A-9. Then go to Step 7.

STEP 2. Check the transaxle oil.

Q: Is the oil dirty?
YES : Replace the oil. Refer to P.22A-8. Then go to Step 7
NO : Go to Step 3.

STEP 3. Check the clutch system.

Q: Is the clutch system normal?
YES : Go to Step 4.
NO : Repair or replace the clutch system. Refer to P.21B-3. Then go to Step 7.

STEP 4. Remove and disassemble the transaxle. Check the control bell-crank dust cover and the shift and select lever shaft.

Q: Is the control housing in good condition?
YES : Go to Step 5.
NO : Repair or replace the control housing (Refer to GROUP 22B, transaxle P.22B-11) Then go to Step 7.

STEP 5. Check for poor meshing or worn synchronizer ring and gear cone.

Q: Is poor meshing or worn synchronizer ring and gear cone found?
YES : Repair or replace the synchronizer ring and gear cone. Then go to Step 7.
NO : Go to Step 6.

STEP 6. Check the synchronizer spring for weakness.

Q: Is the synchronizer spring weak?
YES : Replace the synchronizer spring. Then go to Step 7.
NO : Go to Step 7.

STEP 7. Retest the system.

Q: Is the shifting of the gears still hard?
YES : Return to Step 1.
NO : The procedure is complete.

Inspection Procedure 4: Jumps Out of Gear

DIAGNOSIS PROCEDURE

STEP 1. Check the transaxle control

Q: Are the gearshift cable and the select cable in good condition?
YES : Go to Step 2.
NO : Repair or replace the gearshift cable and the select cable. Refer to P.22B-11. Then go to Step 6.

STEP 2. Remove and disassemble the transaxle. Check the lock ball assembly for breakage.

Q: Is the poppet spring or lock ball assembly broken?
YES : Replace the lock ball assembly (Refer to GROUP 22B, transaxle P.22B-11). Then go to Step 6.
NO : Go to Step 3.

STEP 3. Check the selecting bell-crank assembly and control bell-crank dust cover and the gearshift and select lever shaft.

Q: Is the control housing in good condition?
YES : Go to Step 4.
NO : Repair or replace the selecting bell-crank assembly and control bell-crank dust cover and the gearshift and select lever shaft (Refer to GROUP 22B, transaxle P.22B-11). Then go to Step 6.

STEP 4. Check the gearshift forks for wear.

Q: Is the gearshift forks worn?
YES : Replace the gearshift fork. Refer to GROUP 22B, transaxle P.22B-11. Then go to Step 6.
NO : Go to Step 5.

STEP 5. Check the clearance.

Q: Is the clearance between the synchronizer hub and sleeve excessive?
YES : Replace the synchronizer hub or sleeve. Refer to GROUP 22B, Output Shaft P.22B-29. Then go to Step 6.
NO : Go to Step 6.

STEP 6. Retest the system.

Q: Does the transaxle still jump out of gear?
YES : Return to Step 1.
NO : The procedure is complete.

ON-VEHICLE SERVICE

TRANSAXLE OIL LEVEL CHECK

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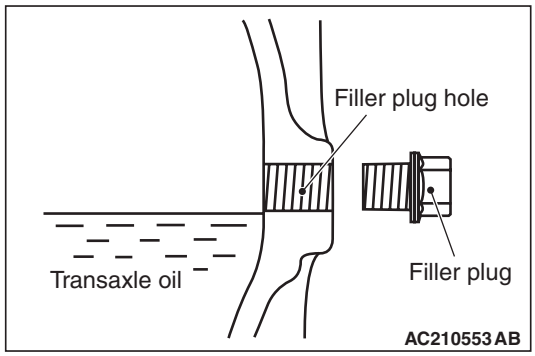

1. Remove the filler plug.
2. Check that the oil level is up to the lower edge of the filler plug hole.
3. Check that the oil is not noticeably dirty.
4. Tighten the filler plug to the specified torque.

   Tightening torque: 32 ±2 N· m (23 ±2 ft-lb)

TRANSAXLE OIL REPLACEMENT

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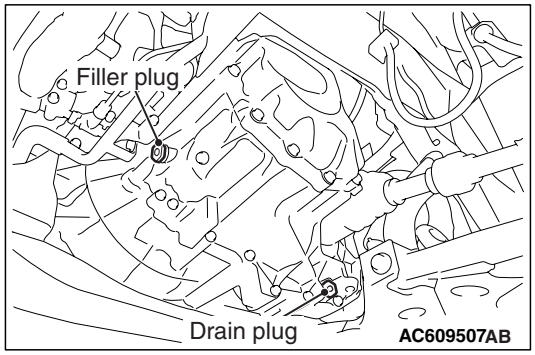

1. Remove the filler plug.
2. Remove the drain plug and drain the oil.
3. Tighten the drain plug to the specified torque.

   Tightening torque: 32 ±2 N· m (23 ±2 ft-lb)
4. Fill with DiaQueen NEW MULTI GEAR OIL API classification GL-3, SAE 75W-80 until the level comes to the lower portion of filler plug hole.

   Quantity:2.5 dm^3 (2.6 quarts)
5. Tighten the filler plug to the specified torque.

   Tightening torque: 32 ±2 N· m (23 ±2 ft-lb)

TRANSAXLE CONTROL

REMOVAL AND INSTALLATION

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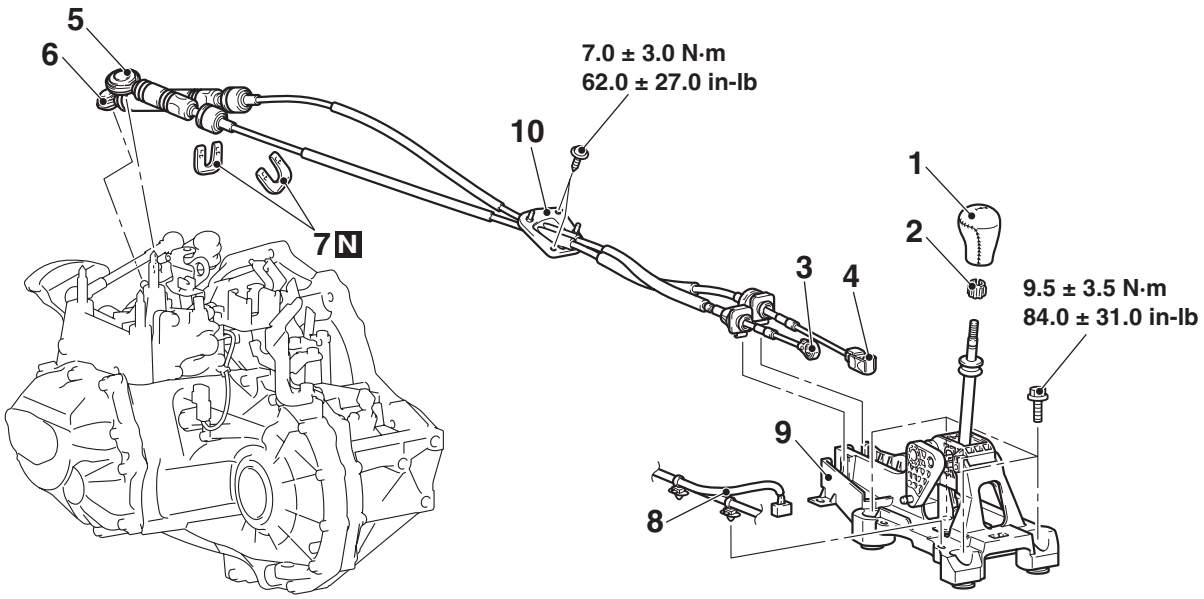
⚠ WARNING

Be careful not to subject the SRS-ECU to any shocks during removal and installation of the gearshift cable and select cable assembly.



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Gearshift cable and select cable assembly removal steps

1. Gearshift lever knob
2. Sleeve
   - SRS-ECU Removal and Installation (Refer to GROUP 52B, SRS-ECU P.52B-364).
3. Select cable connection (Gearshift lever side)

>>B<< 4. Gearshift cable connection (Gearshift lever side)
   - Air Cleaner Assembly Removal and Installation (Refer to GROUP 15, Air Cleaner P.15-4).
   - Battery and Battery Tray Removal and Installation.

<<A>> >>A<< 5. Gearshift cable connection (Transaxle side)

<<A>> >>A<< 6. Select cable connection (Transaxle side)

Gearshift cable and select cable assembly removal steps

<<A>> >>A<< 7. Gearshift link clip

>>A<< 10. Gearshift cable and select cable assembly

Gearshift lever assembly removal steps

1. Gearshift lever knob
2. Sleeve
   - Floor Console Bracket (A) Removal and Installation (Refer to GROUP 52A P.52A-8).
3. Select cable connection (Gearshift lever side)
4. Gearshift cable connection (Gearshift lever side)

8 Harness clamp, connector connection

9. Gearshift lever assembly

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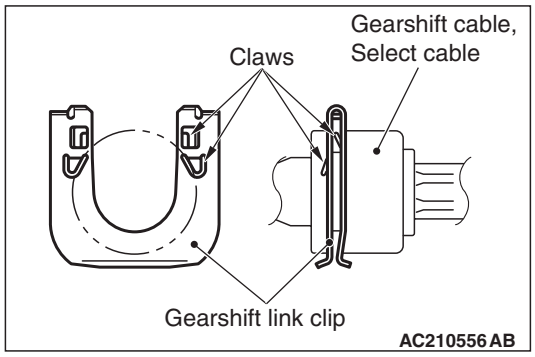
REMOVAL SERVICE POINTS

<<A>> GEARSHIFT LINK CLIP/SELECT CABLE CONNECTION (TRANSAXLE SIDE)/GEARSHIFT CABLE CONNECTION (TRANSAXLE SIDE) REMOVAL



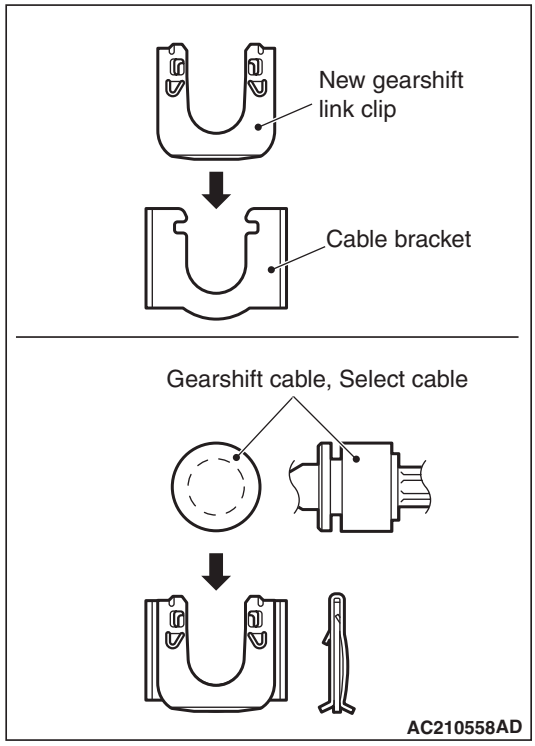
1. Push up the claws of the gearshift link clip using a screwdriver, etc., and then remove the gearshift link clip from the bracket together with the cables.

INSTALLATION SERVICE POINTS

>>A<< GEARSHIFT CABLE AND SELECT CABLE ASSEMBLY/GEARSHIFT CABLE CONNECTION (TRANSAXLE SIDE)/SELECT CABLE CONECTION (TRANSAXLE SIDE)/GEARSHIFT LINK CLIP INSTALLATION

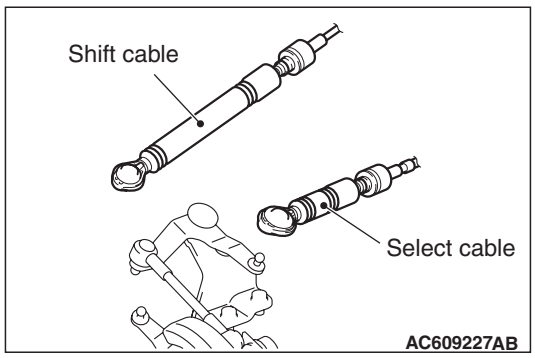
⚠ CAUTION

Insert thoroughly the gearshift link clip, gearshift cable and select cable until they click in place.



1. After installing the new gearshift link clip to the cable bracket of the transaxle, install the gearshift cable and select cable to the cable bracket.

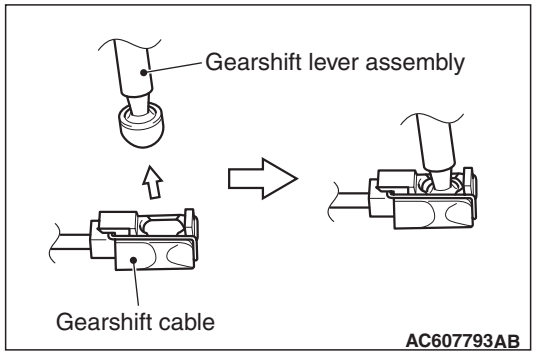
   NOTE: The clip is reversible.



⚠ CAUTION

Check that the clip is securely installed.

2. Securely fit the tips of the gearshift cable and the select cable.
3. Move the shift lever and gearshift lever to all positions and check that the operation is smooth.



>>B<< GEARSHIFT CABLE CONNECTION (GEARSHIFT LEVER SIDE) INSTALLATION

Insert the tip of the gearshift cable to the gearshift lever assembly thoroughly as shown until it clicks in place.

TRANSAXLE ASSEMBLY

REMOVAL AND INSTALLATION

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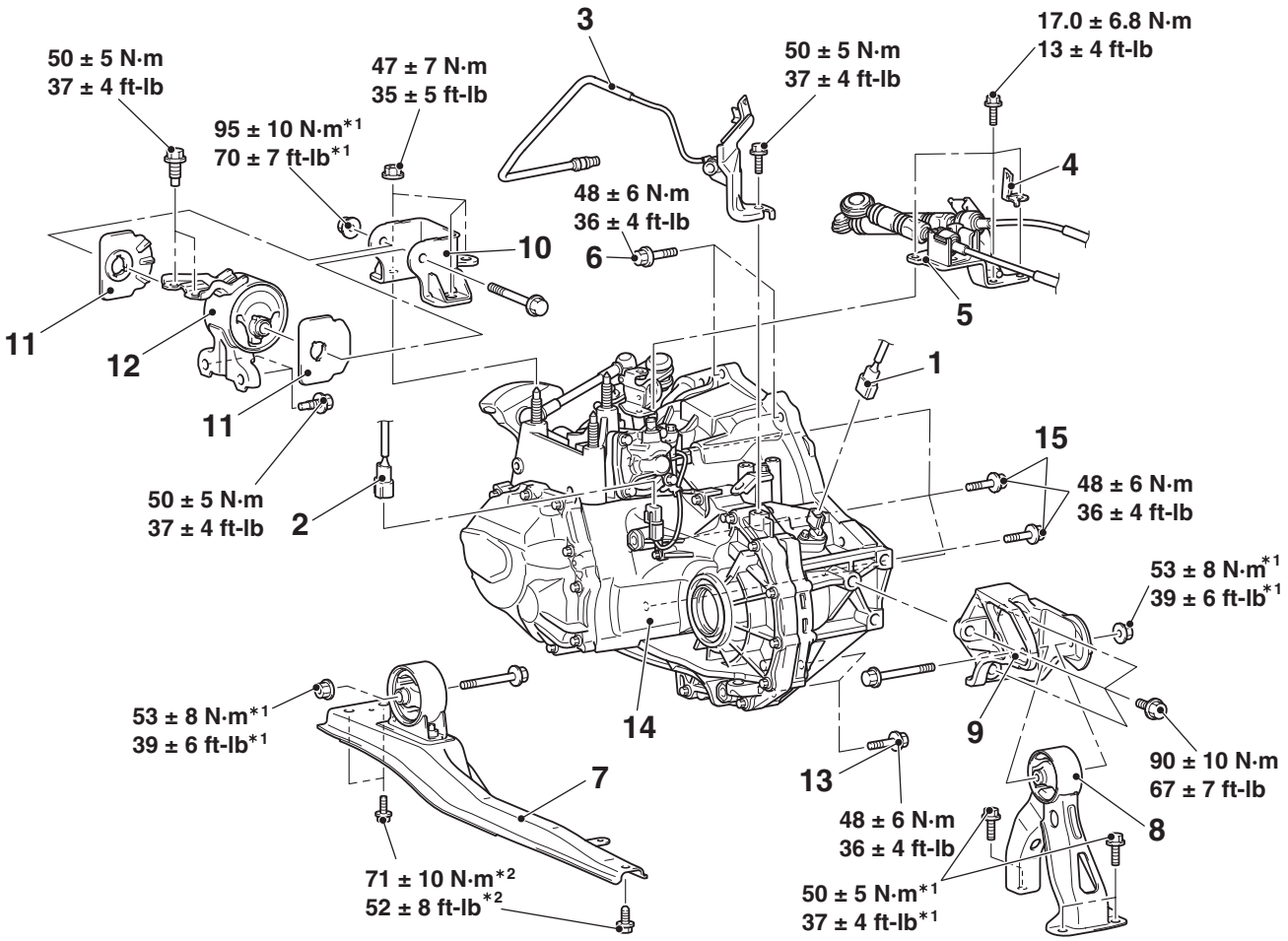
⚠ CAUTION

- **The part indicated by the *1 mark should be temporarily tightened, and then fully tightened with the engine and transaxle assembly weight applied on the vehicle body.**
- **The parts indicated by the *2 are the bolts with friction coefficient stabilizer. In removal, ensure there is no damage, clean dust and soiling from bearing and thread surfaces, and tighten them to the specified torque.**

Pre-removal and Post-installation Operation

- Engine Cover Removal and Installation (Refer to GROUP 11A, Engine assembly P.11A-74).
- Air Cleaner Assembly, Air Intake Hose Removal and Installation (Refer to GROUP 15, Air Cleaner P.15-4).
- Battery and Battery Tray Removal and Installation.
- Water Line Pipe Removal and Installation (Refer to GROUP 14 P.14-22).
- Headlamp Support Panel Cover Removal and Installation (Refer to GROUP 51, Front Bumper Assembly and Radiator Grille P.51-3).
- Starter Motor Assembly Removal and Installation (Refer to GROUP 16, Stator Motor Assembly P.16-27).
- Clutch Fluid Draining.
- Under Cover and Side Cover Removal and Installation (Refer to GROUP 51, Front Bumper Assembly and Radiator Grille P.51-3).
- Transaxle Oil Draining and Refilling (Refer to P.22A-8).
- Drive Shaft Removal and Installation (Refer to GROUP 26 P.26-17).



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Removal steps

1. Speed sensor connector connection
2. Back-up lamp switch connector connection
3. Clutch tube
4. Harness bracket
5. Cable bracket and transmission control cable assembly <Transaxle side>
6. Transaxle assembly upper part coupling bolts
7. Center member assembly
8. Rear roll stopper

Removal steps (Continued)

9. Transaxle case rear roll stopper bracket
   - While supporting the engine and transaxle assembly with a garage jack.
10. Transaxle mouting bracket

>>B<< 11. Transaxle mounting insulator stopper

<<A>> >>A<< 12. Transaxle mounting insulator
<<B>>
   - Engine assembly supporting

13. Transaxle assembly lower part coupling bolts
14. Transaxle assembly

Required Special Tools:

- MB990900 or MB991164: Door adjusting wrench
- MB991895: Engine Hanger
- MB991928: Engine Hanger
- MB991930: Joint (90)
- MB991932: Foot (standard)
- MB992201: Engine hanger plate

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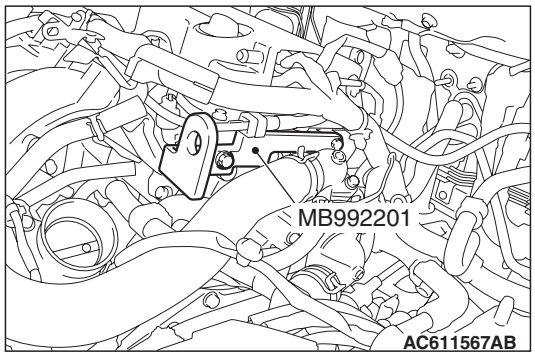
REMOVAL SERVICE POINTS

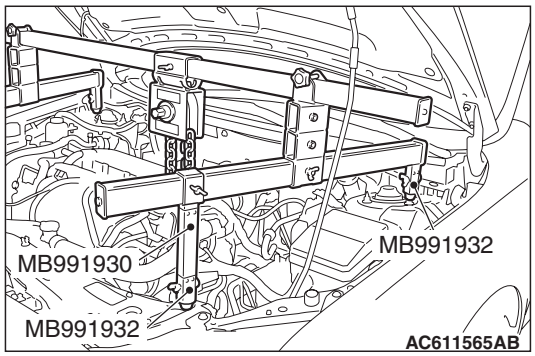
<<A>> TRANSAXLE MOUNTING INSULATOR REMOVAL

Use special tool MB990900 or MB991164 to remove the mounting bolt on the lower side of the transaxle mounting insulator.

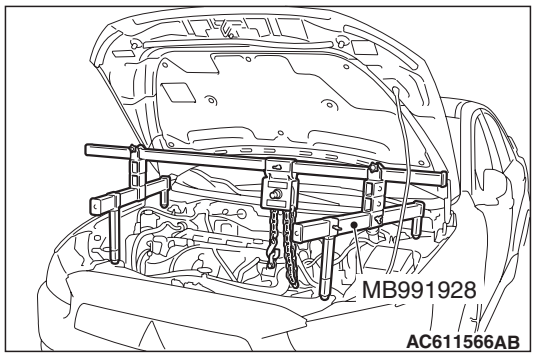
<<B>> ENGINE ASSEMBLY SUPPORTING



1. Remove the vacuum pipe assembly (Refer to GROUP 14 – Water hose and water pipe P.14-22), and install the engine hanger plate (special tool: MB992201) to the position as shown in the figure.
2. <When engine hanger (Special tool: MB991928) is used>
   (1) Assemble the engine hanger (Special tool: MB991928). (Set the components below to the base hanger.)
   - Slide bracket (HI)
   - Foot x 4 (standard) (MB991932)
   - Joint x 2 (90) (MB991930)

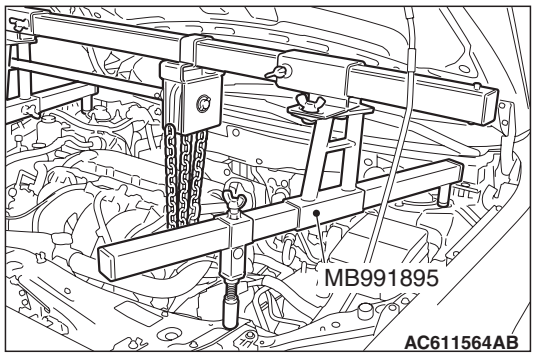


   (2) Set the feet of the special tool as shown in the figure.
   NOTE: Adjust the engine hanger balance by sliding the slide bracket (HI).



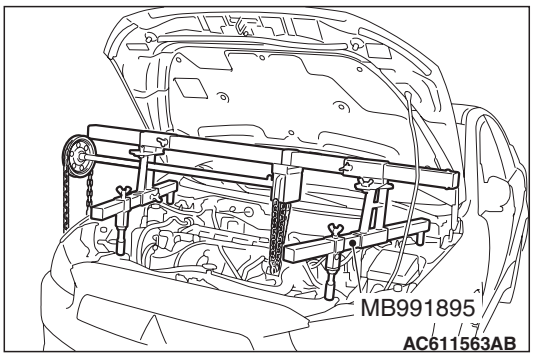
   (3) Remove the garage jack and then remove the transaxle assembly upper part coupling bolts that have been loosened previously.

3. <When using engine mechanical hanger (Special tool: MB991895)>



(1) Set the foot of the engine mechanical hanger (Special tool: MB991895) as shown in the figure.

NOTE: Slide the front foot of the engine mechanical hanger (Special tool: MB991895) to balance the engine hanger.



(2) Remove the garage jack and then remove the transaxle assembly upper part coupling bolts that have been loosened previously.

INSTALLATION SERVICE POINTS

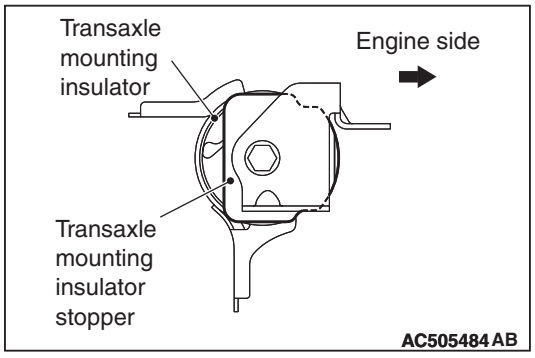
>>A<< TRANSAXLE MOUNTING INSULATOR INSTALLATION

Use special tool MB990900 or MB991164 to install the mounting bolt on the lower side of the transaxle mounting insulator.

Tightening torque: 50 ±5 N· m (37 ±4 ft-lb)

>>B<< TRANSAXLE MOUNTING INSULATOR STOPPER INSTALLATION

Install the transaxle mounting insulator stopper as shown in the figure.



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